

REMARKS

The Examiner is thanked for the thorough examination of this application. The Office Action, however, has tentatively rejected all claim 9-17. In response, Independent claims 9 and 14 have been amended, and new claims 18 and 19 have been added. Support for amended claims 1 can be found in at least FIG. 1B of the application. Therefore, Applicant submits that no new matter has been added. In view of the foregoing amendments and the following remarks, and it is respectfully that the rejections be withdrawn.

Objection to Claim 14

The Office Action objected to claim 14 as failing to provide antecedent basis for the phrase “the metal layer.” Applicant has amended this claim to specify reference to “the first metal layer.” Accordingly, this objection has been addressed and overcome.

Rejections Under 35 U.S.C. 102(b) of Claims 9 and 14

Claims 9, 12, 13, 14, 16 and 17 were rejected under 35 U.S.C. 102(b) as allegedly unpatentable by US. 6,297,519 to Fujikawa et al. Claims 9 is an independent claim, from which claims 10-13 depend. Applicant asserts that amended claim 9 is patentable for at least the reasons discussed below, and therefore for at least the same reasons claims 10-13 are patentable.

The Office Action alleged that :

Fujikawa teaches an interconnect structure, comprising: a first metal layer (22) disposed in the dielectric layer (4), having a first (portion of the top surface) and second (portion of the bottom surface) end;
a plurality of conductive plugs (portions [35b] in the contact holes [25b]) disposed in the dielectric layer (4) and on the first end (portion of the top surface) of the first metal layer (22) to electrically connect the second metal layer (25b).

As amended, however, claim 9 recites:

9. An interconnect structure, comprising:
a substrate *having a surface*;
a dielectric layer disposed on the surface of the substrate;
a first metal layer disposed in the dielectric layer, having a first and second end,
wherein the direction extending from the first end to the second end is parallel to the substrate surface;
a second metal layer disposed on the dielectric layer, wherein the second metal layer is isolated from the first metal layer by the dielectric layer, and
a plurality of conductive plugs parallel to extending direction of the first metal layer disposed in the dielectric layer and on the first end of the first metal layer to electrically connect the second metal layer,
wherein the first metal layer and the second metal layer are a gate metal layer and a source/drain metal layer of a TFT array respectively.

(Emphasis Added).

It is clear that the interconnect structure of amended claim 9 comprises a substrate having a surface, and a first metal layer disposed in the dielectric layer, having a first and second end, wherein the direction extending from the first end to the second end is parallel to the substrate surface, and a plurality of conductive plugs parallel to extending direction of the first metal layer disposed in the dielectric layer and on the first end of the first metal layer to electrically connect the second metal layer.

In contrast, as disclosed by Fujikawa in FIG 4B and page 7, line 63 to page 8, line 7:

The terminal protective conductive film 35b is formed on the protective insulating film 30, covering the inspection gate terminal 22. The terminal protective conductive film 35b is connected via the *contact hole 25b to the inspection gate terminal 22*. Similar to the inspection drain terminal 21 shown in FIG 4A, the gate insulating film 4 and protective insulating film 30 are left in the inner area of the contact hole when the inspection gate terminal 22 is viewed along a direction normal to the substrate surface. It is therefore possible to prevent the underlying inspection gate terminal 22 from being damaged by the probe.

It is clear that Fujikawa does not have or disclose a plurality of conductive plugs parallel to extending direction of the first metal layer disposed in the dielectric layer and on the first end of the first metal layer to electrically connect the second metal layer (35b, 25b, 22 in FIG 4B). For at least this reason, claim 9, as

amended, patently defines over the cited art.

As amended, claim 14 recites:

14. An interconnect structure, comprising:
a substrate *having a surface*;
a dielectric layer disposed on the surface of the substrate;
a first metal layer disposed in the dielectric layer, having a first and second end,
wherein the direction extending from the first end to the second end is parallel to the substrate surface;
a second metal layer disposed on the dielectric layer, and
a plurality of plugs *parallel to extending direction of the first metal layer*
disposed on the first end of the first metal layer, wherein the plug farther from
the first end of the metal layer is conductive and electrically connects the second
metal layer.

(Emphasis Added)

As defined that the interconnect structure in claim 14 comprises a substrate having a surface, and a first metal layer disposed in the dielectric layer, having a first and second end, wherein the direction extending from the first end to the second end is parallel to the substrate surface, and a plurality of plugs parallel to extending direction of the first metal layer disposed on the first end of the first metal layer, wherein the plug farther from the first end of the metal layer is conductive and electrically connects the second metal layer.

However, similar to the remarks set forth with respect to claim 9, the interconnect structure of Fujikawa is significantly different from that in claim 14 of the application. Therefore, reconsideration and withdrawal of this rejection is hereby respectfully requested.

Claims 10-13 and 15-17 each depend from claim 9 and 14, respectively, and patently define over the cited art for at least the same reasons.

Rejections Under 35 U.S.C. 103(a) of Claims 10, 11 and 15

Insofar as claims 10-13 depend from amended claim 9 and claims 15-17 depend from amended claim

14, it's Applicant's believe that these claims are also allowable at least by virtue of their dependency.

New Claims 18-19

New claims 18-19 are added. Independent claim 18 recites:

18. An interconnect structure, comprising:
a substrate;
a dielectric layer disposed the substrate;
a first metal line disposed in the dielectric layer, having a first and second end,
wherein the direction extending from the first end to the second end is parallel to a substrate surface;
a first plug and a second plug disposed on the first end of the first metal line,
wherein the first plug is closer to the first end than the second plug;
a second metal line disposed on the dielectric layer, connecting the first metal line through the second plug.

(Emphasis added.)

Claim 18 patently defines over the cited art of record for at least the reason that the cited art of record does not disclose the features emphasized above.

All pending claims 9-19 are believed to be in condition for allowance, and the Examiner is respectfully requested to pass those claims to issuance. If the Examiner believes a teleconference will expedite the examination of this application, the Examiner is invited to contact the undersigned attorney at 770-933-9500.

No fee is believed to be due in connection with this Amendment and Response to Office Actoin. If, however, any fee is deemed to be payable, you are hereby authorized to charge any such fee to deposit account 20-0778.

Respectfully submitted ,

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